CLAIMS

1.   Apparatus for removing ionisable impurities from an electrolyte solution in an electromembrane device, comprising means for conveying at least one stream of electrolyte solution between a cathode and an anode of the device, and means for transferring selected ions from the electrolyte solution into a separate stream upon application of a current.

2.   Apparatus according to Claim 1, wherein the means for transferring selected ions comprises an anion exchange membrane adjacent the cathode and/or a cation exchange membrane adjacent the anode.

3.   Apparatus according to Claim 2, wherein each said membrane is in contact with an electrode.

4.   Apparatus according to Claim 2, wherein each said membrane is in electrical contact with an electrode by means of a liquid permeable ion conducting material.

5.   Apparatus according to Claim 4, wherein the liquid permeable ion conducting material comprises one or more selected from an ion exchange resin, ion exchange fibres and an ion exchange foam.

6.   Apparatus according to Claim 5, there being a liquid permeable anion conducting material in contact with the cathode and a liquid permeable cation conducting material in contact with the anode.

7.   Apparatus according to any preceding claim, wherein the ion transfer means for transferring selected ions from the electrolyte solution to the separate stream is adapted to transfer anions only.

8.   Apparatus according to any of Claims 1 to 6, wherein the ion transfer means for transferring selected ions from the electrolyte solution to the separate stream is adapted to transfer cations only.

9.   Apparatus according to any of Claims 1 to 6, wherein the ion transfer means for transferring selected ions from the electrolyte solution to the separate stream is adapted to transfer both cations and anions.

10.   Apparatus according to any preceding claim, wherein the selected ions are transferred into a concentrate stream.

11.   Apparatus according to Claim 10, wherein the concentrate stream contains ions removed from a feed liquor by the electromembrane device.

12.   Apparatus according to any preceding claim, wherein the electrolyte solution comprises distilled water.

13.   Apparatus according to any preceding claim, wherein the means for conveying at least one stream of electrolyte solution comprises means for conveying a first stream between the cathode and the anode in contact with the cathode, and means for conveying a second stream between the cathode and the anode in contact with the anode.

14.   Apparatus according to any preceding claim, wherein the means for conveying at least one stream of electrolyte solution comprises means for recirculating the electrolyte solution between the cathode and the anode.

15.   An electromembrane device, including apparatus according to any preceding claim.

16.   An electromembrane device according to Claim 15, being an electrodeionisation and/or electrodialysis device.

17. An electromembrane device according to Claim 15 or Claim 16, being part of a liquid waste treatment system.

18. An electromembrane device according to any of Claims 15 to 17, being part of a waste fluoride treatment system.

19. A process for removing ionisable impurities from an electrolyte solution in an electromembrane device, comprising providing means adapted to transfer selected ions from the electrolyte solution to a separate stream on application of a current to the device, conveying at least one stream of electrolyte solution between an anode and a cathode of the device, and applying a said current.

20. A process according to Claim 19, including the step of providing means adapted to transfer anions only.

21. A process according to Claim 19, including the step of providing means adapted to transfer cations only.

22. A process according to Claim 19, including the step of providing means adapted to transfer both anions and cations.

23. A process according to any of Claims 19 to 22, including the step of transferring the selected ions to a concentrate stream of the electromembrane device.

24. A process according to any of Claims 19 to 23, including the step of conveying between the anode and the cathode at least one stream of electrolyte solution comprising distilled water.

25. A process according to any of Claims 19 to 24, wherein the electrolyte solution is recirculated between the cathode and the anode.

26. An electromembrane process, including the step of operating a process according to any of Claims 19 to 25.

27. An electromembrane process according to Claim 26, being an electrodeionisation and/or electrodialysis process.

28. An electromembrane process according to Claim 26 or Claim 27, being part of a liquid waste treatment process.

29. An electromembrane process according to any of Claims 26 to 28, being part of a waste fluoride treatment process